STANDARD FORM NO. 64

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Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files, RD-103, T. O. 3, 5. 7. 10. 11. 12 DATE: 4 November 1958 25X1

FROM : 25X1

SUBJECT: Trip Report - 25X1

1. On 30 October 1958 the was visited to inspect the progress on Contract RD-103, Task Orders 3, 5, 7, 10, 11, 12. The following persons were contacted: 25X1

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, Alexandria, Virginia, also visited the plant for a conference on the RS-16B progress. 25X1

2. Below are the estimated costs for future AS-6 type of equipment which were requested by The original proposed figure for an AS-6 system (July 1958) was between $400,000 - $500,000. 25X1

QUANTITY

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3. An RS-16A field unit, Serial No. 713, was returned to the contractor to be reworked. Serial No. 712 was to be returned to Washington, D.C.; however, a faulty commutator was discovered at the last moment. The purchase of 3 new commutators was authorized on Task Order 7 at $150 each. The RS-16A units being returned for reworking will have much of the circuitry updated to the RS-16B capability. The power supply voltage should be stabilized on the RS-16A. This can be done by using a zener diode from the power amplifier screen grid to ground. This will result in all output pulses being of the same amplitude. The modification will reduce the output power to 120-150 watts from the 180-200 watts now obtained. However, all pulses will be distinct. With the varying amplitude now it is sometimes difficult to recognize small

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pulses. As for the reduced wattage, the original concept was to obtain 120-130 watts. It has been found that the battery packs for the RS-16A corrode to a great extent during storage. The contractor plans to overcome this by spraying the batteries with an epoxy or some other means. [redacted], was advised of all circuit changes, sheet metal work and coder changes that will be incorporated in the RS-16B. [redacted] is to produce the RS-16C units to perform equally as well as the RS-16B sets. Only minor component changes in the buffer driver circuits remain to be worked out. These will be given to [redacted], when available. Neither the [redacted] have come up with a suitable power supply source. Transistorized power supplies are expensive compared to the vibrator supply used in the RS-16A. However, the success of the RS-18 transistorized power supply (44 shots on one battery) points to the use of this type of supply. The coder improvements that have been made for the RS-16B units look good. It will be possible to interchange coders on these field sets with only a small component change in the keyer amplifier circuit. It will be necessary to make the component change because no two magnetic heads produce the same output. The gap separation in the magnetic heads vary from head to head and will not produce the same voltage output. Spare parts for the ten RS-16B units will cost between $14,000 to $20,000. The contractor can produce these spares more cheaply now when other units are being manufactured. In order to make these spares later, there would be retooling, etc., involved. I authorized [redacted] to proceed with the spares. However, he wants a formal request from us so that he can send a proposal through management to us for increasing the cost on Task Order 10.

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4. A kit and instructions for improving the AGC recovery time in the AS-4A Receive RF Terminal has been returned to Washington. [redacted] can make this change quite easily. Following is a description of what has to be done to get the green light on the audio cabinet of the Transmit Data Terminal to go on when the KX-3 is in the circuit.

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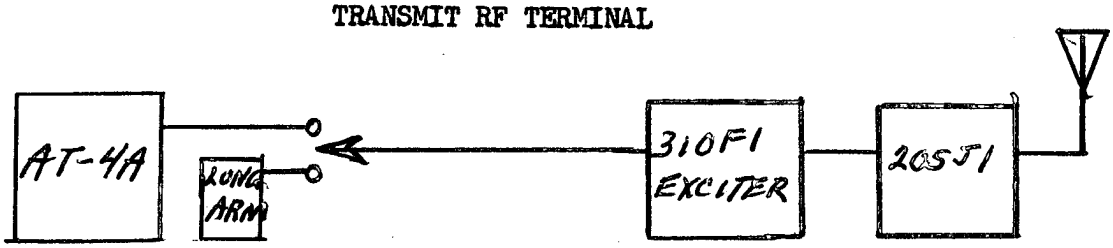
> "The circuit for the green light is completed through the crypto machine. Pins U and V on the plug mounted on the crypto are not normally used. A jumper must be added between these pins in the crypto to complete the circuit. NSA was requested to get these pins jumpered on the machines before delivery but it was not done."

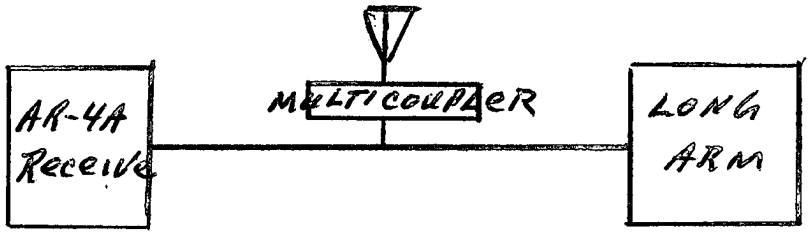
The problem of converting the AS-4 and AS-4A systems to the narrow band width and also providing a redundant system was discussed with the contractor. There are three approaches that can be taken. One is the costly modification of the AS-4 and AS-4A systems to the AS-4B configuration. The second approach is to modify the AS-4 equipment to the AS-4A configuration and then change all our AS-4A's

to narrow band width. Redundancy would be obtained by wheeling up Long Arm cabinets to the transmit and receive RF terminals. Prices have been indicated in [redacted] trip report to the [redacted]. There would be no crypto capability. This would have to be done off-line. The Long Arm output would not be fed through the AS-4A terminals but would be fed directly to the transmitter (see diagram below) and would be received by Long Arm only. 25X1 25X1

TRANSMIT RF TERMINAL



Receive RF TERMINAL



There will be no redundancy on audio lines using Long Arm. However, Long Arm would be a means of providing an order link for use with the AS-4A system. The third approach which can be achieved at approximately the same cost as using Longarm would consist of wheeling up a rack of AS-5 equipment to each of the AS-4A transmit and receive RF terminals. The AS-5 equipment would have to work through the final stages of the AS-4A transmit RF terminal and through the front end of the AS-4A receive RF terminal. The capabilities of this approach are about the same as those using the Longarm conversion. A list of Soroban spare parts is being prepared and will be mailed shortly. [redacted] suggested testing the AS-4A in January on the trans-Atlantic cable. If this is possible from [redacted], it should be tried. 25X1 25X1

5. The contractor was advised to consider the Boeing 707 antenna coupler for the AS-5 as well as the Long Arm coupler. Both are made by the Rand Corporation. The Boeing coupler is simpler. It will only tune to 30 mc as compared with 36 mc for the other coupler. However, the cost of the Boeing coupler is $5,000 to $6,000 compared to $12,000 to $15,000 for the Long Arm coupler. Both couplers will be considered from the

standpoint of choosing the best for the job to be done. A proposal was requested from the [redacted] on the AS-5 testing program and for providing an engineering model for these tests. A formal proposal will be forthcoming soon. [redacted] stated that an engineering model AS-5 will cost us about $53,000. It immediately became apparent that obtaining a separate prototype AS-5 equipment might not cost much more. The estimated cost for another AS-5 will be between $50,000 to $80,000. [redacted] is submitting the cost of a prototype as part of the testing proposal. The second prototype equipment would not require a Flexowriter. The testing proposal is to be considered as an increased cost in Task Order 5. [redacted] pointed out that if the AS-5 is made narrow band, the redundant 11 bit code will not have much gap protection. There will only be about 1 ms protection which is not sufficient. The [redacted] is looking into a seven bit code, like Long Arm, which would provide more protection. This can be put into the AS-5 now at no additional cost.

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6. The service contract, Task Order 7, is down to $4,000 and time runs out in December 1958. I authorized [redacted] to request $20,000 more for this task and to extend the date to August 1959. Training for the AS-5 program will require part of this. Other tasks will require additional money also, such as the AS-6. A quarterly accounting on Task Order 7 will be submitted to us from now on. Attached for interest only is the rocket communication proposal.

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[redacted]

Attachments as above

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